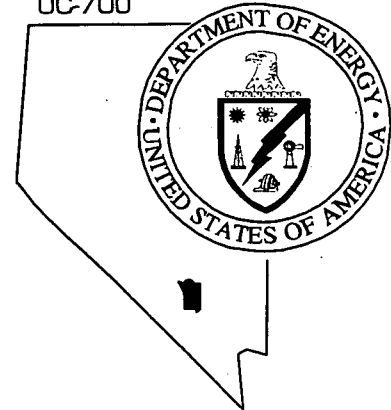


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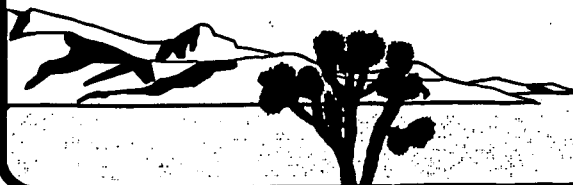


Rulison Site
Groundwater Monitoring Report
Second Quarter, 1997

COPY

August 1997

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**RULISON SITE
GROUNDWATER MONITORING REPORT
SECOND QUARTER, 1997**

DOE Nevada Operations Office
Las Vegas, Nevada

August 1997

**RULISON SITE
GROUNDWATER MONITORING REPORT
SECOND QUARTER, 1997**

Approved by: Janet Appenzeller-Wing
Janet Appenzeller-Wing, Project Manager
Offsites Subproject

Date: 8/15/97

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Nevada Environmental Restoration Project

Date: 8/15/97

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List of Acronyms and Abbreviations

AEC	U.S. Atomic Energy Commission
Austral	Austral Oil Company
BTEX	Benzene, toluene, ethylbenzene, and xylenes
COPC	Constituent(s) of potential concern
DOE	U.S. Department of Energy
EPA	U.S. Environmental Protection Agency
EPA ORIA RSL	U.S. Environmental Protection Agency, Office of Radiation and Indoor Air, Radiation Sciences Laboratory
ft	Foot (feet)
km	Kilometer(s)
LTGMP	Long-Term Groundwater Monitoring Plan
m	Meter(s)
mi	Mile(s)
MS/MSD	Matrix spike/matrix spike duplicate
QAPP	Quality Assurance Project Plan
QC	Quality control
RCRA	<i>Resource Conservation and Recovery Act</i>
RPD	Relative percent difference
SGZ	Surface Ground Zero
TPH	Total petroleum hydrocarbons
TDS	Total dissolved solids
TSS	Total suspended solids
µg/L	Micrograms per liter
VOC	Volatile organic compound

1.0 Introduction

This report summarizes the results of the second quarter 1997 groundwater sampling event for the Rulison Site, which is located approximately 65 kilometers (km) (40 miles [mi]) northeast of Grand Junction, Colorado. The sampling was performed as part of a quarterly groundwater monitoring program implemented by the U.S. Department of Energy (DOE) to monitor the effectiveness of remediation of a drilling effluent pond located at the site. The effluent pond was used for the storage of drilling mud during drilling of the emplacement hole for a 1969 gas stimulation test conducted by the U.S. Atomic Energy Commission (AEC) (the predecessor agency to the DOE), and Austral Oil Company (Austral).

1.1 Site Location

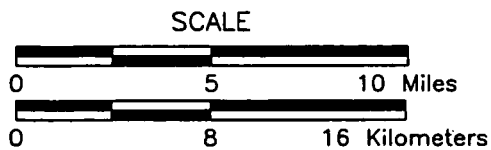
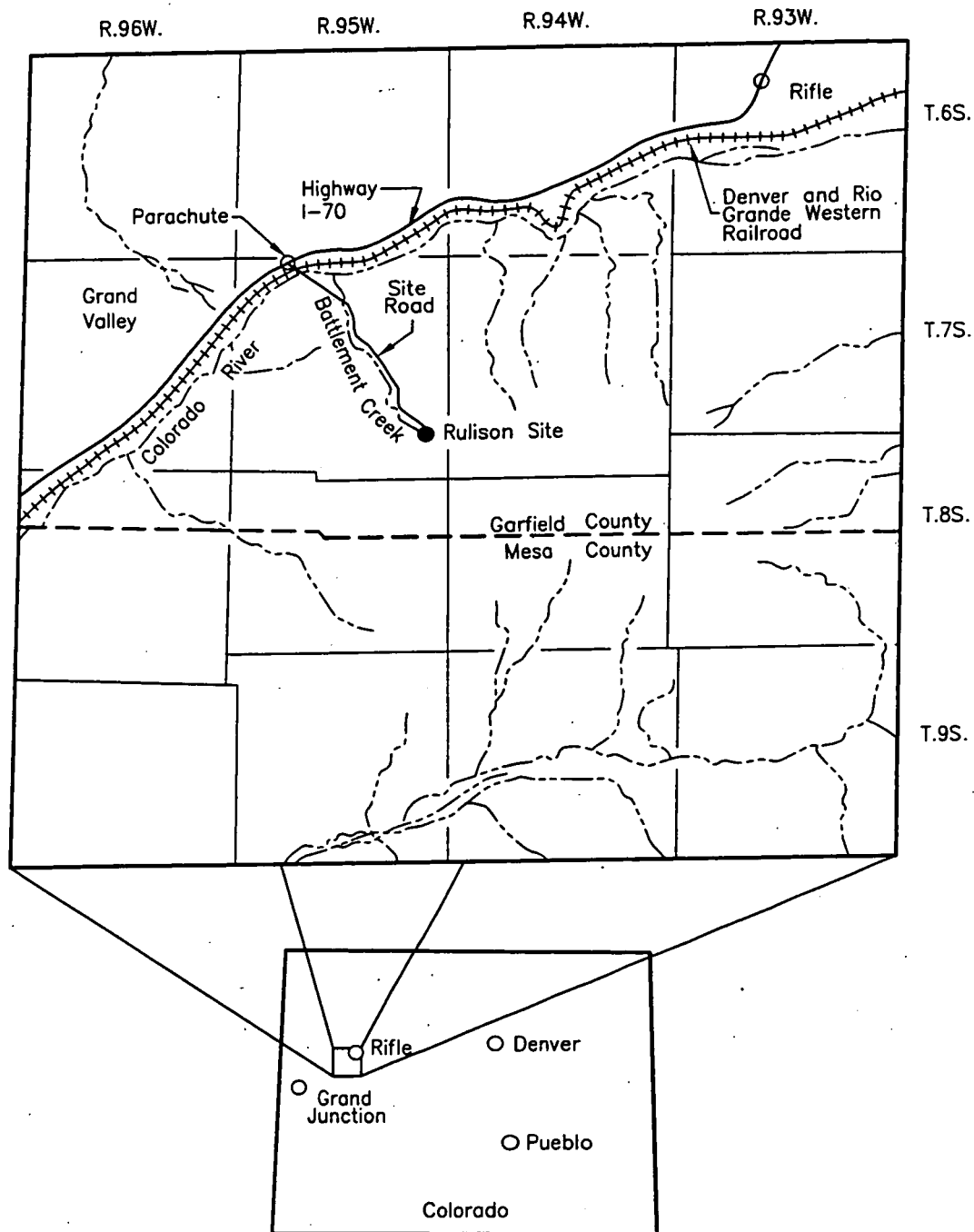
The Rulison Site is located in the North $\frac{1}{2}$ of the Southwest $\frac{1}{4}$ of Section 25, Township 7 South, Range 95 West of the 6th Principal Meridian, Garfield County, Colorado, approximately 19 km (12 mi) southwest of Rifle, Colorado, and approximately 65 km (40 mi) northeast of Grand Junction, Colorado (Figure 1-1). The site is situated on the north slope of Battlement Mesa on the upper reaches of Battlement Creek, at an elevation of approximately 2,500 meters (m) (8,200 feet [ft]). The valley is open to the north-northwest and is bounded on the other three sides by steep mountain slopes that rise to elevations above 2,927 m (9,600 ft).

1.2 Project Description and Background

Project Rulison, a joint AEC and Austral experiment, was conducted under the AEC's Plowshare Program to evaluate the feasibility of using a nuclear device to stimulate natural gas production in low-permeability, gas-producing geologic formations. The experiment was conducted on September 10, 1969, and consisted of detonating a 40-kiloton nuclear device at a depth of 2,568 m (8,426 ft) below ground surface. Natural gas production testing was conducted in 1970 and 1971.

The site was deactivated by the AEC and Austral in 1972 and abandoned in 1976. Cleanup associated with site abandonment consisted of removing all remaining equipment and materials, plugging the emplacement (R-E) and reentry (R-EX) wells (Figure 1-2), backfilling the mud pits adjacent to the R-EX well, removing the tritium-contaminated soils, and conducting extensive surface soil sampling and analysis to characterize the radiological condition of the site.

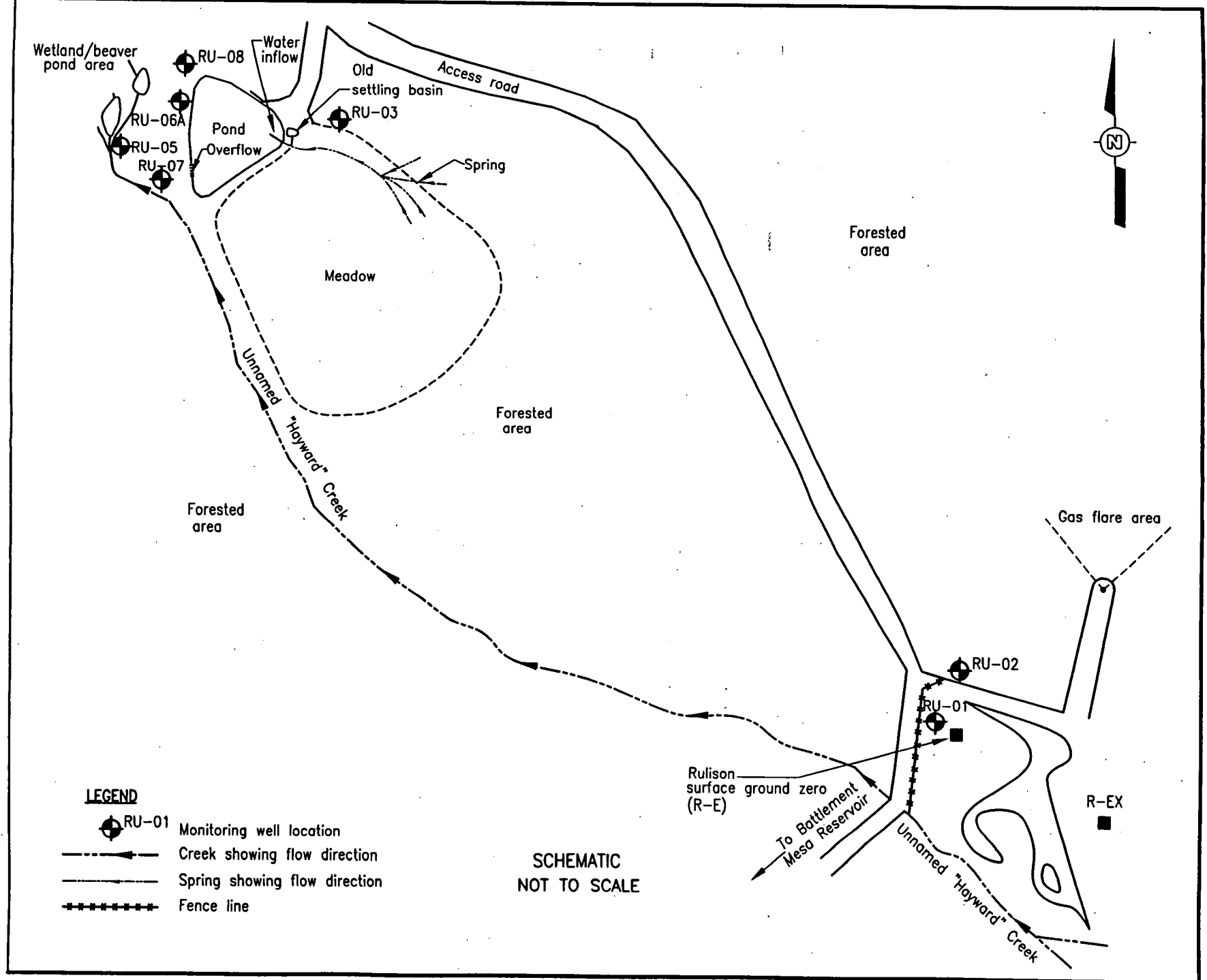
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Source: DRI, 1988

Figure 1-1
Rulison Site Location Map

Figure 1-2
Monitoring Well Locations



Detailed descriptions of the site deactivation and abandonment activities and radiological characterizations are presented in the *Rulison Site Cleanup Report* (AEC, 1973), the *Project Rulison Well Plugging and Site Abandonment Final Report* (ERDA, 1977), and the *Rulison Radiation Contamination Clearance Report* (Eberline, 1977).

The drilling effluent pond is an engineered structure located approximately 400 m (1,312 ft) north-northwest of the surface ground zero (SGZ) emplacement well (R-E) (Figure 1-2). The pond covers approximately 0.5 hectare (1.2 acre) as measured at the top of the berm; it is triangular in shape; and it is approximately 6 m (20 ft) deep from the top of the berm to the pond bottom. The drilling effluent pond was used to store nonradioactive drilling fluids generated during drilling of the device emplacement well R-E. The drilling fluids consisted of bentonite drilling mud that contained various additives, such as diesel fuel and chrome lignosulfonate, used to improve drilling characteristics. Most of the drilling wastes were removed from the pond when the site was cleaned up and decommissioned in 1976; however, some drilling fluid was left in the pond. At the request of the property owner, the pond structure was left in place following completion of site decommissioning and was subsequently converted by the property owner to a freshwater holding pond containing aquatic vegetation, amphibians, and stocked rainbow trout.

In 1994 and 1995, four pond sediment sampling events were conducted to evaluate the extent of residual contamination from drilling wastes remaining in the pond. Concentrations of diesel-range total petroleum hydrocarbons (TPH); benzene, toluene, ethylbenzene, and total xylenes (BTEX compounds); barium; chromium; and lead were found in pond sediment samples and soil samples taken from an old settling basin located adjacent to the pond. Based on the results of the 1994 and 1995 sampling events, the DOE decided to conduct a voluntary cleanup action at the pond to reduce the levels of TPH and chromium in pond sediments and soils in and adjacent to the pond. The cleanup was completed in November 1995. One upgradient monitoring well (RU-03 on Figure 1-2) and four downgradient monitoring wells (RU-05, RU-06A, RU-07, and RU-08) were installed around the pond to monitor the effectiveness of the cleanup. A detailed description of pond cleanup and well installation is presented in the *Rulison Site Corrective Action Report* (DOE, 1996a).

1.3 Summary of Site Activities

The second quarter 1997 sampling event was conducted on June 12, 1997, by personnel from IT Corporation representing the U.S. Department of Energy, Nevada Operations Office. The weather was mostly sunny; temperatures were in the mid 60's F, with light winds. No unusual observations were made, however problems were encountered with several laboratory preserved sample bottles not having sufficient HNO_3 to reduce the sample pH to the required 2 or less.

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2.0 Sampling and Analysis Procedures

The second quarter 1997 groundwater sampling event was conducted in general accordance with the *Rulison Drilling Effluent Pond Site Long-Term Groundwater Monitoring Plan* (LTGMP) (DOE, 1996c) and the *Rulison Site Quality Assurance Project Plan, Rulison Site, Colorado* (QAPP) (DOE, 1996d).

2.1 Groundwater Level Measurement

Before purging and sampling activities at each well began, the depth to groundwater and total depth of the well were measured. This information was used to calculate the appropriate purge volume and to allow evaluation of any potential changes to groundwater flow direction since the previous sampling event.

2.2 Well Purging

Monitoring wells were purged of stagnant groundwater using disposable bailers. The pH, temperature, and conductivity of the groundwater were taken prior to discharging any water to the surface and at regular intervals thereafter. The pH values ranged from 6.97 to 7.46. The purge water was discharged to the ground under Colorado Wastewater Discharge Permit No. COG-310084 as approved by the Colorado Department of Public Health and Environment, Water Quality Control Division (see Appendix A).

2.3 Sample Collection and Handling

Groundwater samples were collected from wells RU-03, RU-05, RU-06A and RU-08 with disposable bottom-emptying bailers. For quality control (QC) purposes, one duplicate sample, one matrix spike/matrix spike duplicate (MS/MSD), a field blank, and an equipment rinse blank sample were collected during the sampling event. In addition, a trip blank accompanied all volatile organic samples in their shipping container. Samples were containerized and preserved as specified in Table 2-1. All containers were certified clean by the laboratory and remained sealed until ready for use.

2.4 Sample Analysis

The groundwater samples from the second quarter 1997 sampling event were analyzed for the parameters listed in Table 2-1, as specified in the Rulison LTGMP (DOE, 1996c). These

parameters included the constituents of potential concern (COPCs) identified for the drilling effluent pond sediments (TPH, BTEX, chromium, iron, zinc, and lead).

Table 2-1
Rulison Site Groundwater Monitoring Program
Sample Container, Preservation, and Analytical Requirements

Parameter	Analytical Method	Sample Container	Minimum Amount of Sample Required	Holding Time	Preservative ^a
BTEX	SW-846 ^b 8020A	Glass with Teflon™-lined cap	3 x 40 mL	14 days	pH <2 with HCl Cool to 4°C
TPH (diesel fraction)	SW-846 8015M ^c	Amber Glass	1 liter	14 days	pH <2 with H ₂ SO ₄ Cool to 4°C
RCRA ^d Metals	SW-846 6010/ 7470A	Polyethylene	1 liter	180 days	HNO ₃ to pH <2 Cool to 4°C, unfiltered
Total Dissolved Solids (TDS)	EPA 160.1 ^e	Polyethylene	100 mL	7 days	Cool to 4°C
Total Suspended Solids (TSS)	EPA 160.2 ^e	Polyethylene	100 mL	7 days	Cool to 4°C
Total Recoverable Chromium, Iron and Zinc	SW-846 3005/6010A	Polyethylene	1 liter	180 days	pH <2 with HNO ₃ Cool to 4°C
Potentially Dissolved Lead	SW-846 6010A	Polyethylene	1 liter	180 days	pH <2 with HNO ₃ Cool to 4°C

^aHolding time calculated from verified time of sample collection. Holding time for mercury is 28 days.

^bU.S. Environmental Protection Agency, SW-846, *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, 3rd Edition (EPA, 1990)

^cEPA SW-846, modified according to the California State Water Resources Control Board, *Leaking Underground Fuel Tank Field Manual, Guidelines for Site Assessment, Cleanup, and Underground Storage Tank Closure*, Appendix B (1989)

^d*Resource Conservation and Recovery Act*

^eU.S. Environmental Protection Agency, *Methods for Chemical Analysis of Water and Wastes*, (EPA, 1983)

mL = Milliliter
HCl = Hydrochloric acid
H₂SO₄ = Sulfuric acid
HNO₃ = Nitric acid
°C = Degrees Celsius

3.0 Analytical Results

The second quarter 1997 analytical results for the pond cleanup COPCs (diesel-range TPH, BTEX, barium, chromium, and lead) for the drilling effluent pond monitoring wells are presented in Table 3-1. Appendix B contains the results for all analytes for the second quarter of 1997 sampling event. The analytical data have not been formally validated, although a limited review of the analytical raw data for laboratory method blanks was performed to ensure that the COPC concentrations reported for the groundwater samples were representative of groundwater quality rather than laboratory contamination. The following sections provide a discussion of the second quarter 1997 groundwater sampling results.

3.1 BTEX

Benzene, toluene, ethylbenzene and xylene were not detected in any of the groundwater samples from the second quarter 1997 sampling event. There were no data qualifiers for any of the samples.

3.2 Diesel-Range TPH

Diesel-range TPH was not detected in any of the groundwater samples from the second quarter 1997 sampling event.

3.3 Inorganics

The second quarter 1997 samples from all wells contained barium at levels ranging from 90 to 146 micrograms per liter ($\mu\text{g/l}$). Chromium was detected in three samples: RU-03, RU-05 and RU-08. In addition, arsenic was detected in all of the samples. Arsenic was not identified as a COPC for pond cleanup and is likely to be of local natural origin. The source of chromium in the groundwater is unknown; however, since it was detected in both the upgradient well (RU-03) and the downgradient wells (RU-05 and RU-08) in similar concentrations ($5.0 \mu\text{g/L}$ in RU-03, $2.5 \mu\text{g/L}$ in RU-05, and $3.1 \mu\text{g/L}$ in RU-08), its presence is not likely to represent migration from the pond sediments. Selenium was not detected in any of the samples.

Table 3-1
Rulison Site Groundwater Analytical Results
Second Quarter, 1997 (all results in $\mu\text{g/L}$)
 (Page 1 of 3)

Well	First Quarter 1996	Second Quarter 1996	Third Quarter 1996	Fourth Quarter 1996	First Quarter 1997	Second Quarter 1997	Third Quarter 1997	Fourth Quarter 1997
TPH - Diesel								
RU-03	100U	94U	500U	500U	1000U	1000U		
RU-05	100U ₁	94U	NS	NS	NS	1100U		
RU-06A	100U	71R	500U	500U	1000U	1000U		
RU-07	NS	NS	NS	NS	NS	NS		
RU-08	100U ₁	94U	NS	NS	NS	1300U		
Benzene								
RU-03	0.5U	0.5U	1U	1U	1U	0.50U		
RU-05	0.5U	0.5U	NS	NS	NS	0.50U		
RU-06A	0.5U	0.5U	1U	1U	1U	0.50U		
RU-07	NS	NS	NS	NS	NS	NS		
RU-08	0.5U	0.5U	NS	NS	NS	0.50U		
Toluene								
RU-03	0.5U	0.5U	1U	1U	1U	1.0U		
RU-05	0.5U	0.5U	NS	NS	NS	1.0U		
RU-06A	0.5U	0.5U	1U	1U	1U	1.0U		
RU-07	NS	NS	NS	NS	NS	NS		
RU-08	0.5U	0.5U	NS	NS	NS	1.0U		
Ethylbenzene								
RU-03	0.5U	0.5U	1U	1U	1U	1.0U		
RU-05	0.5U	0.5U	NS	NS	NS	1.0U		
RU-06A	0.5U	0.5U	1U	1U	1U	1.0U		
RU-07	NS	NS	NS	NS	NS	NS		
RU-08	0.5U	0.5U	NS	NS	NS	1.0U		

3-2

Table 3-1
Rulison Site Groundwater Analytical Results
Second Quarter, 1997 (all results in $\mu\text{g/L}$)
 (Page 2 of 3)

Well	First Quarter 1996	Second Quarter 1996	Third Quarter 1996	Fourth Quarter 1996	First Quarter 1997	Second Quarter 1997	Third Quarter 1997	Fourth Quarter 1997
Xylenes (total)								
RU-03	0.5U	0.5U	1U	1U	1U	1.0U		
RU-05	0.5U	0.5U	NS	NS	NS	1.0U		
RU-06A	0.5U	0.5U	1U	1U	1U	1.0U		
RU-07	NS	NS	NS	NS	NS	NS		
RU-08	0.5U	0.5U	NS	NS	NS	1.0U		
Barium								
RU-03	120	110	105	135	86	90.3		
RU-05	360	120	NS	NS	NS	89.8		
RU-06A	120	120	119	116	118	130		
RU-07	NS	NS	NS	NS	NS	NS		
RU-08	350	140	NS	NS	NS	146		
Chromium								
RU-03	10U	10U	1.5U	6.7	2.2	5.0		
RU-05	24	10U	NS	NS	NS	1.8		
RU-06A	10U	10U	1.5U	1.5U	2.5	1.0U		
RU-07	NS	NS	NS	NS	NS	NS		
RU-08	10U	10U	NS	NS	NS	3.1		
Lead								
RU-03	5.6U	3U	1.5	2.3U	2.0U	2.5		
RU-05	13U	3U	NS	NS	NS	3.1		
RU-06A	3U	3U	0.8U	0.8U	2.0U	2.0U		
RU-07	NS	NS	NS	NS	NS	NS		
RU-08	12U	3U	NS	NS	NS	3.5		

Table 3-1
Rulison Site Groundwater Analytical Results
Second Quarter, 1997 (all results in $\mu\text{g/L}$)
 (Page 3 of 3)

Well	First Quarter 1996	Second Quarter 1996	Third Quarter 1996	Fourth Quarter 1996	First Quarter 1997	Second Quarter 1997	Third Quarter 1997	Fourth Quarter 1997
Selenium								
RU-03	<i>16</i>	<i>14</i>	2.8U	2.8U	4.0U	3.0U		
RU-05	<i>7.2</i>	<i>6</i>	NS	NS	NS	3.0U		
RU-06A	<i>12</i>	<i>20</i>	2.8U	2.8U	4.0U	3.0U		
RU-07	NS	NS	NS	NS	NS	NS		
RU-08	<i>12</i>	<i>22</i>	NS	NS	NS	3.0U		

Values in italics are for the dissolved fraction

Values in bold are the second quarter 1997 sampling event results

NS = Well dry - no sample collected

U = Analyte not detected above the specified value

R = Quality control indicates that the data are unusable (compound may or may not be present)

J = Reported value is estimated:

There currently are insufficient data to establish concentration trends or to determine whether total barium concentrations in groundwater downgradient from the pond are significantly elevated above background level. Statistical trends will be calculated as data are acquired from additional quarterly groundwater monitoring events.

3.4 *Groundwater Flow*

Groundwater depth and elevation data for the drilling effluent pond monitoring wells from the second quarter 1997 sampling event are presented in Table 3-2. Based on the groundwater elevation data, it appears that groundwater flow during the second quarter sampling event was generally towards the northwest. Under this flow condition, well RU-03 is upgradient from the pond, and wells RU-06A and RU-08 are downgradient from the pond.

Table 3-2
Rulison Site Groundwater Elevations
Second Quarter, 1997

Well	First Quarter 1996	Second Quarter 1996	Third Quarter 1996	Fourth Quarter 1996	First Quarter 1997	Second Quarter 1997	Third Quarter 1997	Fourth Quarter 1997
Depth to Water (bgs)								
RU-03	10.56 m (34.65 ft)	6.81m (22.33 ft)	12.94 m (42.44 ft)	12.93 m (42.42 ft)	10.90 m (35.75 ft)	3.24m (10.64 ft)		
RU-05	2.35 m (7.71 ft)	1.96 m (6.42 ft)	Dry	Dry	3.05 m ¹ (10.0 ft)	1.05 m (3.43 ft)		
RU-06A	4.74 m (15.56 ft)	4.38 m (14.38 ft)	5.55 m (18.20 ft)	4.72 m (15.5 ft)	5.66 m (18.56 ft)	3.20 m (10.51 ft)		
RU-07	Dry	Dry	Dry	Dry	3.11 m ¹ (10.2 ft)	Dry		
RU-08	1.78 m (5.85 ft)	1.70 m (5.58 ft)	Dry	Dry	2.23 m ¹ (7.3 ft)	0.80 m (2.63 ft)		
Groundwater Elevation								
RU-03	2444.29 m (8019.33 ft)	2448.05 m (8031.65 ft)	2441.92 m (8011.54 ft)	2441.92 m (8011.56 ft)	2443.96 m (8018.23 ft)	2450.46 m (8039.58 ft)		
RU-05	2433.95 m (7985.41 ft)	2434.35 m (7986.70 ft)	< 2434.09 m (< 7985.87 ft)	< 2434.09 m (< 7985.87 ft)	2433.26 m (7983.12 ft)	2433.84 m (7985.05 ft)		
RU-06A	2430.10 m (7972.78 ft)	2430.46 m (7973.96 ft)	2429.30 m (7970.14 ft)	2430.12 m (7972.84 ft)	2429.19 m (7969.78 ft)	2430.46 m (7973.95 ft)		
RU-07	< 2438.91 m (< 8001.67 ft)	< 2438.91 m (< 8001.67 ft)	< 2438.91 m (< 8001.67 ft)	< 2438.91 m (< 8001.67 ft)	2438.15 m (7999.17 ft)	< 2438.91 m (< 8001.67 ft)		
RU-08	2429.05 m (7969.33 ft)	2429.13 (7969.60 ft)	< 2429.01 m (< 7969.18 ft)	< 2429.01 m (< 7969.18 ft)	2428.61 m (7967.88 ft)	2428.65 m (7968.01 ft)		

¹ Well had less than 1 foot of water so was not sampled.

4.0 Quality Control Results

Field and laboratory QC sample requirements and acceptance criteria are specified in the Rulison QAPP (DOE, 1996d). The laboratory narrative for the second quarter sampling analytical results is included in Appendix B and provides a summary of the results for laboratory QC samples required under the various analytical methods used for the project. The following sections describe the results for field QC samples that are not covered by the laboratory narratives because they are not explicit requirements under the analytical methods used, but they are required for field sampling under the Rulison QAPP (DOE, 1996d).

4.1 Field Duplicate Samples

Field duplicate samples are used to monitor the variability associated with sample collection procedures and to provide estimates of the total sampling and analytical precision. A duplicate sample was collected from well RU-06A during the sampling event. The relative percent differences (RPDs) between analytes detected in the original sample and the same analytes detected in the associated field duplicate sample were calculated and compared against the precision acceptance criteria specified in the Rulison QAPP (DOE, 1996d). The sample and sample duplicate results, calculated RPDs, and precision acceptance criteria are presented in Table 4-1.

Arsenic and barium were the only analytes detected in the RU-06A sample and/or sample duplicate. The RPDs for arsenic (3 percent) and barium were within the precision acceptance criterion of ± 20 percent specified in the Rulison QAPP (DOE, 1996d). Chromium was not detected in either the sample or the duplicate.

4.2 Equipment Rinsate Blank Samples

Equipment rinsate blanks are used to monitor potential cross-contamination associated with inadequate equipment decontamination procedures. An equipment rinse blank was prepared by using deionized water to rinse a disposable bailer prior to its use. No contaminants were found in the equipment rinsate blank.

Table 4-1
Rulison Site Groundwater Monitoring Program
Duplicate Sample Comparison:
Second Quarter, 1997
 (All results in µg/L)

Analyte	Well RU-6A			RPD Acceptance Criterion
	Sample	Sample Duplicate	RPD ¹	
TPH	1000U	1000U	ND	± 40
Benzene	0.50U	0.50U	ND	± 11 to 24
Toluene	1.0U	1.0U	ND	± 11 to 24
Ethylbenzene	1.0U	1.0U	ND	± 11 to 24
Xylenes	1.0U	1.0U	ND	± 11 to 24
Arsenic	3.3	3.4	3.0	± 20
Barium	130	130	ND	± 20
Cadmium	1.0U	1.0U	ND	± 20
Chromium	1.0U	1.0U	ND	± 20
Lead	2.0U	2.0U	ND	± 20
Mercury	0.2U	0.2U	ND	± 20
Selenium	3.0U	3.0U	ND	± 20
Silver	1.0U	1.0U	ND	± 20

¹Relative percent difference

U = Analyte not detected above the specified value
 ND = Not Determined

4.3 Trip Blank Samples

Trip blanks are used to monitor potential volatile organic compound (VOC) cross-contamination introduced into VOC sample containers through diffusion during sample shipment and storage. Trip blank samples were placed in each container used for shipping BTEX samples. BTEX compounds were not detected in the trip blank from the second quarter sampling event.

5.0 Summary and Conclusions

The analytical data from the second quarter 1997 groundwater sampling event indicate that migration of contaminants from the drilling effluent pond sediments currently does not appear to be occurring. The following is a summary of the second quarter 1997 groundwater sample results:

BTEX Compounds: BTEX compounds were not detected in any of the second quarter groundwater samples.

Diesel-Range TPH: Diesel-range TPH was not detected in any of the second quarter groundwater samples.

Inorganics: Barium and chromium were the only pond cleanup COPCs detected in the second quarter 1997 groundwater samples. Chromium was detected in the upgradient monitoring well (RU-03), well RU-05 and well RU-8. Chromium was not detected this quarter in the downgradient monitoring well (RU-06A). Because it was detected in the upgradient well, its presence is not likely to represent migration from the pond sediments. As discussed in Section 3.3, there currently are insufficient data to establish concentration trends or to determine whether barium concentrations in groundwater downgradient from the drilling effluent pond are significantly elevated above background. Statistical trends will be calculated as data are acquired from additional quarterly sampling events.

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6.0 References

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Appendix A

Purge Water Discharge Permit

03-19-1996 17:39
03/19/1996 16:35

702 2951113
303-782-0390

DCE/ERO
CLH WQCD WQCD

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PAGE 02

STATE OF COLORADO

Roy Romo, Governor
Paul Shwyetel, Acting Executive Director

Dedicated to protecting and improving the health and environment of the people of Colorado

4300 Cherry Creek Dr. S.
Denver, Colorado 80222-1530
Phone (303) 692-7000

Laboratory Building
4210 E. 11th Avenue
Denver, Colorado 80220-3716
(303) 691-4700



Colorado Department
of Public Health
and Environment

March 19, 1996

Mr. Kevin D. Leary
DOE

Subject: Reply to request for addition of source to permit COG-310084.

Dear Mr. Leary:

The Division has received and reviewed your fax of 3/19/96. Since the wells described in your fax are in such close proximity to the pond that the permit was designed to provide dewatering conditions for, the Division

will allow the wells to be dewatered using the same discharge point as described in the permit. Please follow the same conditions and monitoring schedule as described in the permit. The Division realizes that due to the small amount of water in question, the water might not be of sufficient flow to reach the discharge point. Any future purgings of the water from these wells are covered by this letter and the permit noted above as long as the permit remains active and conditions, monitoring schedule and reporting procedure are followed.

Please feel free to call me at (303)+692-3593 with questions or comments.

Sincerely,

A handwritten signature in black ink, appearing to read "Tom Boyce".

Tom Boyce
Environmental Protection Specialist
Permits and Enforcement
WATER QUALITY CONTROL DIVISION

cc:file

Appendix B

Second Quarter 1997 Analytical Results

Sample Number and Associated Well

Sample Number	Well Number
RUW-00106	RU-3
RUW-00107	RU-5
RUW-00108	RU-6A
RUW-00109	RU-6A (Duplicate)
RUW-00110	RU-8

LAS LABORATORIES

TOTAL PETROLEUM HYDROCARBONS (TPH)
8015M - TPH

Client Sample ID: RUW-00106
Date Collected: 12-JUN-97
Date Analyzed: 01-JUL-97
Date Extracted: 18-JUN-97
Matrix: Water

LAS Sample ID: L9696-31
Date Received: 14-JUN-97
Analytical Batch ID: 062697-8015-D-4
Analytical Dilution: 1
Preparation Dilution: 1.0
QC Group: 8015M - TPH_49739

SURROGATE	RECOVERY	QC Limits
n-OCTACOSANE	52%	26-152

CONSTITUENT	CAS NO.	RESULT mg/L	PQL mg/L	DATA QUALIFIER(S)
Diesel Range Organics	TPH	<1.0	1.0	

LAS LABORATORIES

TOTAL PETROLEUM HYDROCARBONS (TPH)
8015M - TPH

Client Sample ID:	RUW-00107	LAS Sample ID:	L9696-34
Date Collected:	12-JUN-97	Date Received:	14-JUN-97
Date Analyzed:	02-JUL-97	Analytical Batch ID:	062697-8015-D-4
Date Extracted:	18-JUN-97	Analytical Dilution:	1
Matrix:	Water	Preparation Dilution:	1.1
		QC Group:	8015M - TPH_49739

SURROGATE	RECOVERY	QC Limits
n-OCTACOSANE	49%	26-152

CONSTITUENT	CAS NO.	RESULT mg/L	PQL mg/L	DATA QUALIFIER(S)
Diesel Range Organics	TPH	<1.1	1.1	

LAS LABORATORIES

TOTAL PETROLEUM HYDROCARBONS (TPH)
8015M - TPH

Client Sample ID:	RUW-00108	LAS Sample ID:	L9696-35
Date Collected:	12-JUN-97	Date Received:	14-JUN-97
Date Analyzed:	02-JUL-97	Analytical Batch ID:	062697-8015-D-4
Date Extracted:	18-JUN-97	Analytical Dilution:	1
Matrix:	Water	Preparation Dilution:	1.0
		QC Group:	8015M - TPH_49739

SURROGATE	RECOVERY	QC Limits
n-OCTACOSANE	56%	26-152

CONSTITUENT	CAS NO.	RESULT mg/L	PQL mg/L	DATA QUALIFIER(S)
Diesel Range Organics	TPH	<1.0	1.0	

LAS LABORATORIES

TOTAL PETROLEUM HYDROCARBONS (TPH)
8015M - TPH

Client Sample ID: RUW-00109
Date Collected: 12-JUN-97
Date Analyzed: 02-JUL-97
Date Extracted: 18-JUN-97
Matrix: Water

LAS Sample ID: L9696-36
Date Received: 14-JUN-97
Analytical Batch ID: 062697-8015-D-4
Analytical Dilution: 1
Preparation Dilution: 1.0
QC Group: 8015M - TPH_49739

SURROGATE	RECOVERY	QC Limits
n-OCTACOSANE	60%	26-152

CONSTITUENT	CAS NO.	RESULT mg/L	PQL mg/L	DATA QUALIFIER(S)
Diesel Range Organics	TPH	<1.0	1.0	

LAS LABORATORIES

TOTAL PETROLEUM HYDROCARBONS (TPH)
8015M - TPH

Client Sample ID: RUW-00110
Date Collected: 12-JUN-97
Date Analyzed: 02-JUL-97
Date Extracted: 18-JUN-97
Matrix: Water

LAS Sample ID: L9696-37
Date Received: 14-JUN-97
Analytical Batch ID: 062697-8015-D-4
Analytical Dilution: 1
Preparation Dilution: 1.3
QC Group: 8015M - TPH_49739

SURROGATE	RECOVERY	QC Limits
n-OCTACOSANE	45%	26-152

CONSTITUENT	CAS NO.	RESULT mg/L	PQL mg/L	DATA QUALIFIER(S)
Diesel Range Organics	TPH	<1.3	1.3	

LAS LABORATORIES

8020A BTEX
P&T GAS/BTEX

Client Sample ID:	RUW-00107	LAS Sample ID:	L9696-10
Date Collected:	12-JUN-97	Date Received:	14-JUN-97
Date Analyzed:	24-JUN-97	Analytical Batch ID:	052297-BTEX-GC3
Date Extracted:	N/A	Analytical Dilution:	1
Matrix:	Water	Preparation Dilution:	1.0

SURROGATE	RECOVERY	QC Limits
BFB	98%	60-140
1,4-DFB	96%	75-125

CONSTITUENT	CAS NO.	RESULT ug/L	PQL ug/L	DATA
				QUALIFIER(S)
Benzene	71-43-2	<0.50	0.50	
Toluene	108-88-3	<1.0	1.0	
Ethylbenzene	100-41-4	<1.0	1.0	
M & P Xylene	136777-61-2	<1.0	1.0	
O Xylene	95-47-6	<1.0	1.0	

LAS LABORATORIES

8020A BTEX
P&T GAS/BTEX

Client Sample ID:	RUW-00108	LAS Sample ID:	L9696-13
Date Collected:	12-JUN-97	Date Received:	14-JUN-97
Date Analyzed:	24-JUN-97	Analytical Batch ID:	052297-BTEX-GC3
Date Extracted:	N/A	Analytical Dilution:	1
Matrix:	Water	Preparation Dilution:	1.0

SURROGATE	RECOVERY	QC Limits
1,4-DFB	96%	75-125
BFB	96%	60-140

CONSTITUENT	CAS NO.	RESULT ug/L	PQL ug/L	DATA QUALIFIER(S)
Benzene	71-43-2	<0.50	0.50	
Toluene	108-88-3	<1.0	1.0	
Ethylbenzene	100-41-4	<1.0	1.0	
M & P Xylene	136777-61-2	<1.0	1.0	
O Xylene	95-47-6	<1.0	1.0	

LAS LABORATORIES

8020A BTEX
P&T GAS/BTEX

Client Sample ID:	RUW-00109	LAS Sample ID:	L9696-16
Date Collected:	12-JUN-97	Date Received:	14-JUN-97
Date Analyzed:	24-JUN-97	Analytical Batch ID:	052297-BTEX-GC3
Date Extracted:	N/A	Analytical Dilution:	1
Matrix:	Water	Preparation Dilution:	1.0

SURROGATE	RECOVERY	QC Limits
BFB	98%	60-140
1,4-DFB	96%	75-125

CONSTITUENT	CAS NO.	RESULT ug/L	PQL ug/L	DATA
				QUALIFIER(S)
Benzene	71-43-2	<0.50	0.50	
Toluene	108-88-3	<1.0	1.0	
Ethylbenzene	100-41-4	<1.0	1.0	
M & P Xylene	136777-61-2	<1.0	1.0	
O Xylene	95-47-6	<1.0	1.0	

LAS LABORATORIES

8020A BTEX
P&T GAS/BTEX

Client Sample ID: RUW-00110
Date Collected: 12-JUN-97
Date Analyzed: 24-JUN-97
Date Extracted: N/A
Matrix: Water

LAS Sample ID: L9696-19
Date Received: 14-JUN-97
Analytical Batch ID: 052297-BTEX-GC3
Analytical Dilution: 1
Preparation Dilution: 1.0

SURROGATE	RECOVERY	QC Limits
BFB	98%	60-140
1,4-DFB	96%	75-125

CONSTITUENT	CAS NO.	RESULT ug/L	PQL ug/L	DATA QUALIFIER(S)
Benzene	71-43-2	<0.50	0.50	
Toluene	108-88-3	<1.0	1.0	
Ethylbenzene	100-41-4	<1.0	1.0	
M & P Xylene	136777-61-2	<1.0	1.0	
O Xylene	95-47-6	<1.0	1.0	

Lab Name: L.A.S

Contract: IT INT.

RUW-00106

Lab Code: LOCK

Case No.: 614IT

SAS No. :

SDG No. : L9696W

Matrix (soil/water): WATER

Lab Sample ID: L9696-43

Level (low/med) : LOW

Date Received: 06/14/97

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

[illegible]

Color Before: COLORLESS

Clarity Before: CLOUDY

Texture:

Color After: COLORLESS

Clarity After: CLEAR

Artifacts:

Comments :

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B-11

8/15/97 Revision 6

1

INORGANIC ANALYSES DATA SHEET

RUW-00107

Lab Name: L.A.S Contract: IT INT.

Lab Code: LOCK Case No.: 614IT SAS No.: SDG No.: L9696W

Matrix (soil/water): WATER Lab Sample ID: L9696-50

Level (low/med) : LOW Date Received: 06/14/97

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

[illegible]

Color Before: COLORLESS Clarity Before: CLOUDY Texture: _____

Color After: COLORLESS Clarity After: CLEAR Artifacts: _____

Comments :

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8/15/97 Revision 6'

Lab Name: L.A.S. _____ Contract: IT_INT. _____
Lab Code: LOCK__ Case No.: 614IT_ SAS No.: _____ SDG No.: L9696W
Matrix (soil/water): WATER Lab Sample ID: L9696-55__
Level (low/med): LOW__ Date Received: 06/14/97
% Solids: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

[illegible]

Color Before: COLORLESS Clarity Before: CLOUDY Texture: _____
Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____
Comments: _____

FORM I - IN

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CLIENT ID NO.

Lab Name: L.A.S _____ Contract: IT INT.

Lab Code: LOCK Case No.: 614IT SAS No.: SDG No.: L9696W

Matrix (soil/water): WATER Lab Sample ID: L9696-58

Level (low/med): LOW__ Date Received: 06/14/97

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

[illegible]

Color Before: COLORLESS Clarity Before: CLOUDY Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments :

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